

Application No. 10/801,402
Response to Office Action

Customer No. 01933

Listing of Claims:

1. (Currently Amended) A defect inspection apparatus comprising:

an inspection section which inspects a front surface and a rear surface of a sample;

5 a control section which processes image data on the front surface and rear surface of the sample obtained by the inspection section;

a moving section provided in the inspection section ~~and capable of for~~ reciprocating the sample;

10 ~~an illumination section which illuminates the front surface and rear surface of the sample moved by the moving section; and~~

~~an image pickup section which picks up images of the front surface and rear surface of the sample illuminated by the illumination section,~~

15 wherein at least one of an incidence angle of the illumination section on the sample and an image pickup angle of the image pickup section to the sample is changeable,

wherein the incidence angle and the image pickup angle are set to a first angle for picking up a regular reflection image,

20 wherein at least one of the incident angle and the image pickup angle is changed to a second angle for picking up an image other than the regular reflection image,

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25 wherein the regular reflection image is picked up at the
 first angle when the sample is moved in one direction, and the
 image other than the regular reflection image is picked up at the
 second angle when the sample is moved in a direction opposite to
 the one direction, and

30 wherein a defect inspection result obtained from the regular
 reflection image and a defect inspection result obtained from the
 image other than the regular reflection are added.

Claim 2 (Canceled).

3. (Currently Amended) The defect inspection apparatus according to claim ~~2~~ 1, wherein the first angle for picking up an image of the front surface of the sample and the first angle for picking up an image of the rear surface of the sample are the same.

Claim 4-15 (Canceled).

5 16. (Currently Amended) The defect inspection apparatus according to ~~any of~~ claim 1, wherein the illumination section includes a linear light source which applies a linear parallel light to the surface of the sample at a predetermined incidence angle, and the image pickup section includes a line sensor camera

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which picks up an image of the sample linearly irradiated by the linear light source.

17. (New) A defect inspection apparatus comprising:
an inspection section which inspects a front surface and a rear surface of a sample;
a control section which processes image data on the front
5 surface and rear surface of the sample obtained by the inspection section;
a moving section provided in the inspection section for reciprocating the sample;
an illumination section which illuminates the sample moved
10 by the moving section; and
an image pickup section which picks up images of the sample illuminated by the illumination section,
wherein at least one of an incidence angle of the illumination section on the sample and an image pickup angle of
15 the image pickup section to the sample is changeable,
wherein the moving section includes an invertible holding member which holds the front surface and rear surface of the sample while leaving them open,
wherein the illumination section and the image pickup
20 section are disposed on one side of the sample held by the holding member, and

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wherein the holding member is inverted after inspecting one of the front surface and rear surface of the sample, and the other one of the front surface and rear surface of the sample is
25 next inspected.

18. (New) A defect inspection apparatus comprising:
an inspection section which inspects a front surface and a rear surface of a sample;
a control section which processes image data on the front
5 surface and rear surface of the sample obtained by the inspection section;

a moving section provided in the inspection section for reciprocating the sample;

illumination sections which illuminate the sample moved by
10 the moving section; and

image pickup sections which pick up images of the sample illuminated by the illumination sections,

wherein at least one of an incidence angle of the illumination sections on the sample and an image pickup angle of
15 the image pickup sections to the sample is changeable,

wherein the moving section comprises a holding member including a transparent material, and

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wherein the illumination sections and the image pickup
sections are respectively disposed on both sides of the sample
20 held by the holding member.

19. (New) A defect inspection apparatus comprising:
an inspection section which inspects a front surface and a
rear surface of a sample;

a control section which processes image data on the front
5 surface and rear surface of the sample obtained by the inspection
section;

a moving section provided in the inspection section for
reciprocating the sample;

illumination sections which illuminate the sample moved by
10 the moving section; and

image pickup sections which pick up images of the sample
illuminated by the illumination sections,

wherein at least one of an incidence angle of the
illumination sections on the sample and an image pickup angle of
15 the image pickup sections to the sample is changeable,

wherein the moving section comprises a holding member that
is movably stood in a Z axis direction,

wherein the holding member comprises one of: (i) a structure
for holding the sample such that the front surface and the rear

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20 surface of the sample are open, and (ii) a rear side surface that
is transparently formed, and

wherein the illumination sections and the image pickup
sections, which inspect respectively the front surface and rear
surface of the sample, are respectively disposed on both sides of
25 the holding member.

20. (New) A defect inspection apparatus comprising:

an inspection section which inspects a front surface and a
rear surface of a sample;

a control section which processes image data on the front
5 surface and rear surface of the sample obtained by the inspection
section;

a moving section provided in the inspection section for
reciprocating the sample;

an illumination section which illuminates the sample moved
10 by the moving section; and

an image pickup section which picks up images of the sample
illuminated by the illumination section,

wherein at least one of an incidence angle of the
illumination section on the sample and an image pickup angle of
15 the image pickup section to the sample is changeable,

wherein the inspection section comprises a first inspection
section which inspects the front surface of the sample and a

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second inspection section which inspects the rear surface of the sample, and

20 wherein the second inspection section is provided between a carrying section which carries the sample, and the first inspection section.

21. (New) A defect inspection apparatus comprising:
an inspection section which inspects a front surface and a rear surface of a sample;

5 a control section which processes image data on the front surface and rear surface of the sample obtained by the inspection section;

a moving section provided in the inspection section for reciprocating the sample;

10 first and second illumination sections which illuminate the sample moved by the moving section; and

first and second image pickup sections which pick up images of the sample illuminated by the illumination sections,

15 wherein at least one of an incidence angle of the illumination sections on the sample and an image pickup angle of the image pickup sections to the sample is changeable,

wherein the moving section comprises a carrying arm which holds the rear surface of the sample while leaving the rear

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surface open, and a holding member which receives the sample from the carrying arm and holds the sample, and

20 wherein the first illumination section and the first image pickup section are disposed on a rear surface side of the sample in a carrying path of the carrying arm, and the second illumination section and the second image pickup section are disposed on a front surface side of the sample held by the
25 holding member.

22. (New) A defect inspection apparatus comprising:
an inspection section which inspects a front surface and a rear surface of a sample;

5 a control section which processes image data on the front surface and rear surface of the sample obtained by the inspection section;

a moving section provided in the inspection section for reciprocating the sample;

10 an illumination section which illuminates the sample moved by the moving section; and

an image pickup section which picks up images of the sample illuminated by the illumination section,

15 wherein at least one of an incidence angle of the illumination section on the sample and an image pickup angle of the image pickup section to the sample is changeable, and

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wherein the moving section comprises a plurality of
non-contact carrying conveyers which carry the sample, and

wherein a clearance to pick up an image of the rear surface
of the sample is provided in a direction crossing a carrying
20 direction of the sample in a carrying path of the plurality of
carrying conveyers.

23. (New) A defect inspection apparatus comprising:

an inspection section which inspects a front surface and a
rear surface of a sample;

a control section which processes image data on the front
5 surface and rear surface of the sample obtained by the inspection
section;

a moving section provided in the inspection section for
reciprocating the sample;

an illumination section which illuminates the sample moved
10 by the moving section; and

an image pickup section which picks up images of the sample
illuminated by the illumination section,

wherein the incidence angle and the image pickup angle are
set to a first angle for picking up a regular reflection image,

15 wherein at least one of the incident angle and the image
pickup angle is changed to a second angle for picking up an image
other than the regular reflection image,

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wherein the regular reflection image is picked up at the
first angle when the sample is moved in one direction, and the
20 image other than the regular reflection image is picked up at the
second angle when the sample is moved in a direction opposite to
the one direction, and

wherein the regular reflection image and the image other
than the regular reflection image are synthesized to perform
25 defect inspection.